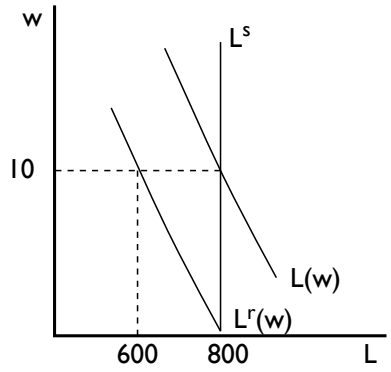
ECON 110, Professor Hogendorn

Problem Set 9 Answers

1. *Sticky_a.*

   (a) The graph is:



   (b) The labor market clears at a wage of 0! All the workers work for free, not that they like it (but it would result in huge dividends).

   (c) The sticky wages stay at 10, so the number of workers hired falls to 600.

   (d) 25% of the 800 units of labor supplied is now unemployed, so 25% is a fairly reasonable answer. But in fact, the labor market equilibrium always includes some background frictional and structural unemployment to begin with, so we usually have about a 5% *natural rate of unemployment* even at "full employment." Thus 30% is the best answer.

2. *OkunsLaw_a.*

   (a) Since the natural rate of unemployment already includes prevailing frictional and structural unemployment, the only type of unemployment that occurs when the economy is away from "full employment" is cyclical.

   (b) Using Okun's Law, we know that the unemployment gap is 2%. Thus, the GDP gap is 4%.

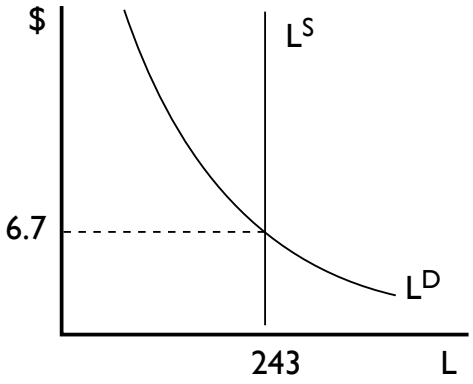
3. *GermansNotWorking_a.*

   (a) We can find labor demand by using the profit-maximzing condition for a firm whose profit function is written in terms of labor. This is $pMP_L = w$:

   $$1 \cdot \frac{3}{5} 100 L^{-2/5} = w \Rightarrow L^D(w) = \left(w \frac{5}{3 \cdot 100} \right)^{-5/2}$$

   We assumed that there is only one good produced in Germany and its price is set to 1. We assume that all German firms can be modeled by one representative firm, and that this firm behaves like a perfect competitor.

   (b) The equilibrium real wage when all 243 workers are working will be $\frac{3}{5} 100 (243)^{-2/5} = 6.7$.



Even though the economy is at "full employment," there is still underlying structural and frictional unemployment. This comprises the "natural rate of unemployment," which might be around $U^N = 0.05$.

(c) In this economy, the full employment level of output is $Y^P = f(243) = 100(243)^{3/5} = 2700$. Filling in this and the unemployment rates into Okun's Law gives

$$\frac{2700 - Y}{2700} \approx 2(0.10 - 0.05) \Rightarrow Y = 2430$$